Anza Borrego Desert Integrated Regional Water Management
September 2010

1.0 Background Section

History of Region

At first glance, proximity to Anza-Borrego Desert State Park seems to be the only piece of the puzzle shared by all members forming the Integrated Regional Water Management group that bears the giant park's name. However, the small, unincorporated communities now seeking a planning grant to assist in creating the new IRWMP are united also by the fact that their groundwater drains toward the Colorado River. Furthermore, they have similar problems with water supply – isolated locations; small populations; reliance on a source of groundwater that is diminishing or endangered; inadequate and outdated infrastructure to deliver and store water; and lack of resources to fund solutions. A case in point is the central piece of the puzzle, Borrego Springs, which is located in the middle of Anza-Borrego Desert State. It's 50 miles in any direction to the desert community's nearest neighbors. That fact has been the town's salvation by keeping rampant development at bay, but also forms its biggest challenge as the area addresses a significant overdrafting of the underground aquifer that is the valley's only source of water.

The valley's earliest human inhabitants, the Kumeyaay and Cahuilla Indians, had minimal water needs. Establishing their villages in canyons with easy access to streams and plentiful supplies of food staples like mesquite, chia and agave, the tribes annually moved up into the surrounding mountains to follow the harvest and escape summer heat. As winter neared, they reversed the process. That harmonious situation began to change with the discovery of the valley by European explorers. A Spaniard, Juan Bautista de Anza, first laid eyes on the area in 1774 while scouting a land route to northern California. He returned the following year with a colonizing party that traveled to the coast and northward to establish San Francisco.

After de Anza put the Borrego Valley on the map, word spread very slowly about the area that offers three long seasons of mild temperatures, surrounding a scorching summer. A few hardy souls ventured into the area to homestead or run cattle, but through the 1920s they amounted to only a handful. Without telephone service or paved roads, they lived lives of isolation, save for their neighbors. While a resourceful lot, they also depended on other residents for help when needed. A small enclave near the Borrego Sink became the hub for the tiny community of Borego Springs (spelled with one "r" in those days). Its post office, gas station and store that opened in 1928 were the first commercial buildings. Soon a branch of the county library was added. With families comprising much of the population, a one-room schoolhouse was built and a teacher hired. The hard times of the Depression in the 1930s attracted more homesteaders and farmers; they sank wells and found water plentiful and close to the surface. That resource enabled them to scratch out a living, although they had to travel for days through the desert on dirt roads to take their harvest to market or obtain supplies. Early farming was

difficult, at best. Extreme heat, high winds, occasionally violent rainstorms and associated flooding, kept the back county area from becoming a thriving economic region.

A paradigm shift occurred in the late 1930s when major agricultural interests realized that their crops would ripen in Borrego's mild climate before those grown elsewhere. They could be first to reach market and thus command top dollar. The Di Giorgio and Burnand families began purchasing large portions of the valley from the railroads and early homesteaders. Major wells were sunk, watering crops of cotton, vegetables, grapes, dates and even gladiolas. Cattle, hogs and turkeys were among livestock raised. Electrical service came to the valley in 1945, but the first paved road didn't arrive until 1949. Water usage skyrocketed and began to exceed annual recharge, creating up an overdraft that continues to this day. A.A. Burnand Jr. also had a vision of the Borrego Valley as a "desert playground," featuring recreation and modern homes as well as agriculture. In 1946 the San Diego County Board of Supervisors approved the first subdivision map in the valley.

The state park has been a part of Borrego since the early 1930s, when both Borrego Palms Desert State Park and Anza State Park were founded in the area. The two state parks merged in 1957 and the name was changed to Anza-Borrego Desert State Park. It now encompasses more than 600,000 acres and makes up 70 percent of the Anza-Borrego Desert IRWM area. More than a million people a year visit ABDSP that is the second largest state park in the nation. Ocotillo Wells State Vehicular Recreation Area adjoins ABDSP and 50,000 off-road enthusiasts annually take advantage of its 80,000 acres of off-road terrain.

Resorts sprang up and attempts to create the area's first golf course finally bore fruit with the start of de Anza Country Club in 1955. Water usage continued to climb. Grapes have not been the primary crop since 1968; citrus has taken the top spot in local agriculture. Five golf courses stay green with water from the aquifer. About 3,000 residents, including many seasonal "snowbirds," also have their water needs met from the aquifer. The valley currently uses 20,000 acre-feet of water, with recharge from rainfall and runoff amounting to only 4,000 acre-feet annually.

Today the basin's water-levels are dropping at a rate of three feet per year and a recent announcement by the U.S. Geological Survey suggests that the upper aquifer, the most prolific of the three known aquifers, could be depleted in the next 50 years. Even the surrounding desert and Anza-Borrego Desert State Park are affected by the water decline. The decline of the mesquite trees in the Borrego Sink is one indication that effect is taking place. The future of the entire IRWM area depends on adequate water. The question is how best to ensure it. This planning grant would be a big step in that direction.

1.1 The Regional Water Management Group

The Anza Borrego Desert (ABD) IRWM Region was established as a result of the RAP. Initially, it was proposed that an area generally encompassing the Borrego Valley in the Colorado River Basin hydrologic unit in northern San Diego county area become an IRWM Region. This initial proposal was conceived primarily because of the general remoteness of the Borrego Valley within the Region of San Diego County located east of the Peninsular Range. Water management issues east of the Range are entirely local as no water supply agency exists to oversee this area's water needs in contrast to the area west of the Range where the San Diego County Water Authority (SDCWA) has Regional water supply authority. Further, the Region is sparsely populated, with the Borrego Valley (Borrego Springs Community) being the largest population center.

The Borrego Valley area contains the only significant alluvial groundwater basin east of the Range. The Borrego Valley aquifer has provided sufficient water to develop a large agricultural economy and a moderate residential and recreational base. The area is also widely known for its annul 'wild flowers' display which attracts as much as 500,000 visitors in years when the wild flows are abundant. Unfortunately, the main water producing aquifer of the Borrego Valley Basin is in a serious state of overdraft, with a limited useful life of about 50 years. The overdraft is estimated at about 4 to 5 times the natural yield of the basin.

The overdraft and the resultant lowering of groundwater levels have lead to conflicts between the residential community and the growers. Adding to the mix is that the BS Community is entirely surrounded by the ABD State Park. The continuing over extractions has deprived native flora and fauna of on the periphery of the groundwater basin.

To help resolve the overdraft situation, various stakeholders in the Valley in 2000 began working with the BWD to provide input and suggestions to BWD as part of the development of the Groundwater Management Plan in 2002.

At the suggestion of DWR during the RAP, it was proposed to enlarge the Borrego Valley Region to include all areas within San Diego County east of the Peninsular Range and south of Borrego Valley to the border with Mexico. This enlargement created a Region that almost wholly encompasses the ABD State Park. The enlarged Region increased the water supply districts from one to four and the number of domestic water supply connections from 2,000 to 3,000. The three additional communities obtain their water supply from local fractured rock aquifers with unknown sustainable yields. But all four water suppliers are remote from each other, thus making it difficult to conceive of a 'Regional' water supply solution. This created a significant challenge for the IRWM process.

To comply with the IRWM requirements, a Regional Water Management Group was formed to implement the process. Three local agencies comprise the RWMG; the BWD, the County of San Diego and the Resource Conservation District of Greater San Diego County (RCD). While the BWD only has authority in the northern portion of the Region, both the County and RCD have authorities in the entire Region.

The BWD role in the process is that of a water supply and groundwater management agency of the Region's largest water supply source. The County has also been involved in the water management process in the Borrego Valley collection of annual groundwater level data and the development of land use restrictions that prevent

an increase in the overdraft of the aquifer. They also monitor groundwater levels in the remaining areas of the Region. The RCD brings important expertise to the RWMG in the areas of soil and water conservation and the removal of exotic flora species.
The following is a description of the composition of the ABD RWMG.

The Borrego Water District: The Borrego Water District (BWD) was established in 1962 as a California water district. The District provides water, sewer, and flood control and gnat abatement for areas in the unincorporated community of Borrego Springs. Additionally, the District adopted a groundwater management plan under Assembly Bill 3030 in 2002 and obtained the authority of a groundwater replenishment district.

The County of San Diego: The County is charged with providing flood protection throughout the unincorporated areas of the county. However, the BWD has responsibilities for flood control in its Improvement District #1.

The County of San Diego has regulatory control over land uses. Developers must obtain permits from the Department of Planning and Land Use (DPLU) to develop land in the Borrego Valley.

The Resource Conservation District of Greater San Diego County (RCD): The RCD is an independent, non-enterprise (local government) special district. Its purpose is to promote and provide conservation education, to conduct research, and to advise and assist other public agencies and private individuals in the areas of land-use planning, soil and water conservation, wildlife habitat enhancement and restoration, control of exotic plant species, and watershed restoration.

1.2 The Region

The Anza Borrego Desert Region is located in the Lower Colorado River Hydrologic unit. This 850,000 acre Region is almost entirely in the County of San Diego, with a small area in southern Riverside County. The Region is bounded on the east by Imperial County; on the south by Mexico; on the west by the Peninsular Range and on the north by Riverside County, except for that portion of the Coyote Creek watershed that extends into the county. Figure 1-1 (attached) provides a spatial rendering of the Region and key features.

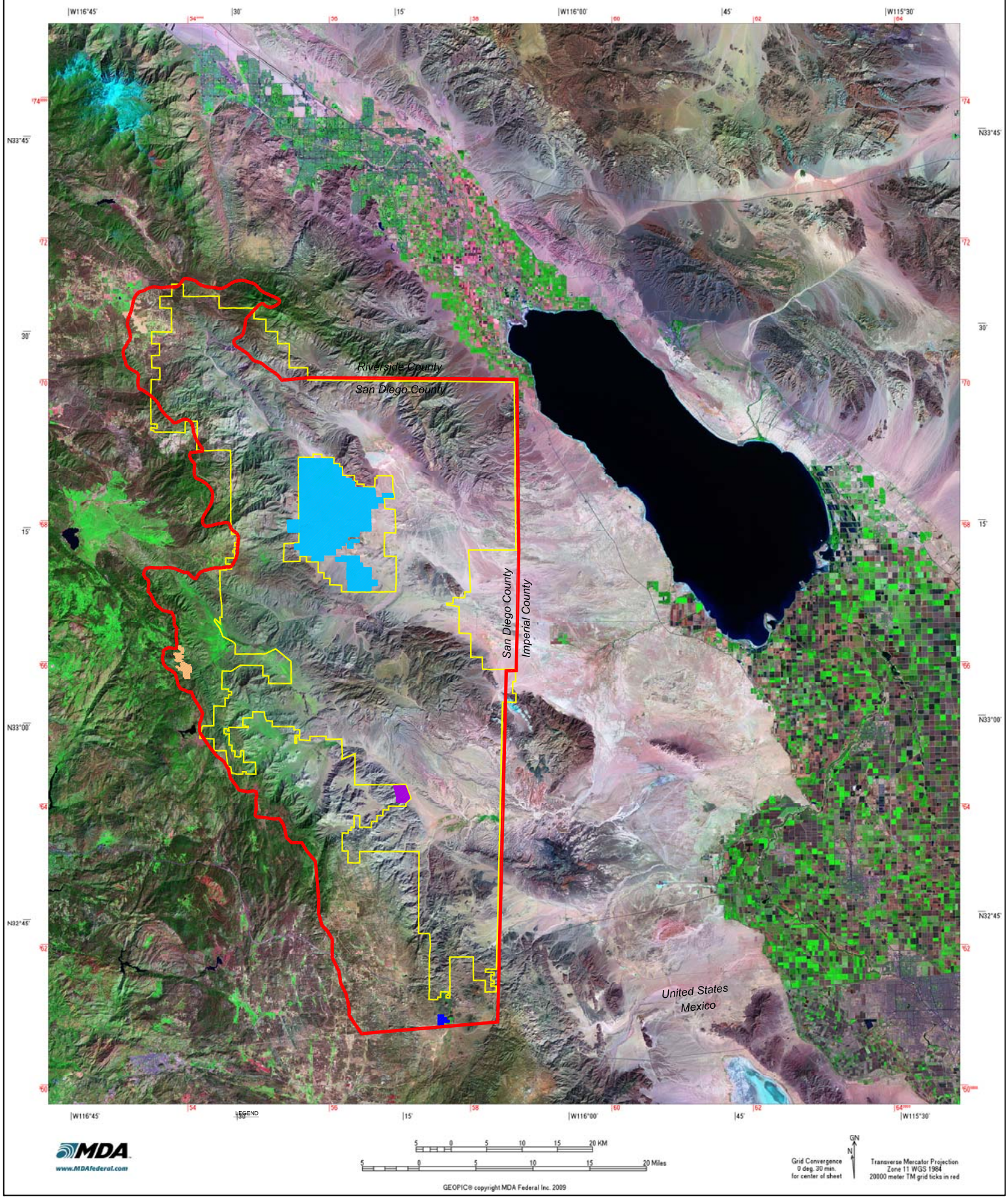
The topography of Region has a major effect on meteorology, hydrology, soils, vegetative communities, wildlife habitat use, and human use patterns of the Region. Elevations range from a few feet above sea level to over 6,000 feet the granitic Peninsular Range. Deep canyons on the eastern slopes of the Range, some with perennial water, support native California fan palms. Alluvial fans extend from the canyon mouths. The Region is an active seismic area. The landscape shows many elongated ridges and valleys which trend northwest–southeast along the scores of active faults, in the zone where the North American Plate clashes with the Pacific Plate.

Topographically enclosed drainage basins contain interior valleys with no outlets are common. The eastern portion of the Region is made up of ancient sea bottom, shoreline, marsh, and inland lake deposits. Mountain masses are scattered throughout the Region and are thought to be related to the Peninsular Range and made of the same parent rock.

Borrego Water District

Landsat7 ETM+ Bands 742 (RGB)

Paths 039/040 Row 37 11 Oct / 24 Sep - 2009



MDA
www.MDAfederal.com

5 0 5 10 15 20 KM

5 0 5 10 15 20 Miles

GEOPIC® copyright MDA Federal Inc. 2009

GN
N

Grid Convergence
0 deg. 30 min.
for center of sheet

Transverse Mercator Projection
Zone 11 WGS 1984
20000 meter TM grid ticks in red

LEGEND

- INTEGRATED REGIONAL WATER MANAGEMENT BOUNDARY
- ANZA-BORREGO DESERT STATE PARK BOUNDARY
- BORREGO WATER DISTRICT
- CANEBRAKE WATER DISTRICT
- JACUMBA C.S.D.
- MAJESTIC PINES C.S.D.

Borrego Water District

ANZA BORREGO DESERT
INTEGRATED WATER MANAGEMENT REGION

Imperial, San Diego and Riverside Counties, California

FIGURE: 1-1

Annual precipitation is sparse and variable throughout the Region ranging from 2 to 6 inches at stations on the desert floor, but occasional flash flooding associated with a Monson Season can bring torrential rainfall and destructive flooding.

The Region experiences mild temperatures in the winter months and hot temperatures in the summer. In a typical year *(Borrego Desert Park Station)* , monthly extreme high temperatures go over 85° F (29° C) as early as March, and are routinely over 100° F (38° C) by May. From June through September, the monthly extreme high temperatures will routinely exceed 110° F (43° C). Not until November, will monthly maximum temperatures stay consistently below 100° F.

1.2.1 Land Ownership in the Region

The Anza Borrego State Park occupies about 70% of the Region.
Forest Lands 5%
Bureau of Land Management 10%
Private Lands 10%
Other 5%

1.2.2 Drinking Water Systems and Use

Four communities (two of which have opted not to participate in the IRWM process) with organized water delivery system are located within the Region. These have a total of about 3,000 service connections, primarily residential with a total water use of about 3,000 afy. Only the Borrego Springs community is expected to experience future growth but that growth is expected to be supported by reduction in agricultural water use.

Water Purveyor	No. Connections
Borrego WD	2,125
Canebrake CWD	78
Jacumba CSD	234
Majestic Pines CSD	684

1.2.3 Other Water Uses

The most significant water use in the Region is for agricultural and recreational use in the Borrego Valley area. These uses are currently about 20,000 afy and are not expected to increase in the future.

1.2.4 Wastewater Treatment Facilities

Domestic and commercial sewage is typically disposed of though septic tanks, leach fields or pits throughout the Region, except in some locations in Borrego Springs and Julian areas where treatment facilities control the wastewater.

1.2.5 Flood Control Responsibilities

The San Diego County Flood Control District is responsible for flood control in the entire Region, with the exception of a small area in the Borrego Valley, known as the Improvement District No. 1 of the BWD.

1.2.6 Land Use Regulatory Agencies

As the Region is comprised mainly of federal and state lands; nearly all of the Region land uses are under the jurisdiction either State or Federal government, while Indian Tribal lands are jointly managed by the individual tribes and the Bureau of Indian Affairs.

The remaining privately held lands are regulated by the County of San Diego, Department of Planning and Land Use as there are no incorporated municipalities in the Region.

1.2.7 Ecological Process and Environmental Resources

The Anza-Borrego Desert State Park General Plan and Environmental Impact Report (2005) contains substantial amounts of information about the Park's biological and environmental resources. The Report describes the many and varied flora and fauna species that occupy the relatively desert floor and mountain regions of the Park. Presumably, the area of the Region not included in the Park is similar to the Park characteristics.

1.5 Identification of DAC and their Inclusion in the Process

A review of the 2000 Census (factfinder) showed that the Borrego Valley's Median Household Income is less than 80% of the State wide average. Since the 2000 census does not provide a geographic breakdown of areas within the census tract, it was not possible to identify a specific area of the Borrego Springs community as 'disadvantaged'.

2000 Census data was also queried for the Canebrake CWD. The Median Household Income for the blocks comprising this water agency showed a 2000 census MHI greater than 80% of the State wide average. Since the other two water agencies declined to participate in the IRWM process, their MHI was not determined.

Since the entire community of Borrego Springs is considered disadvantaged, and the public members of that community, local NGOs and non-profits were participants in the Stakeholders Committee, the Borrego Valley DAC was engaged. To further engage the community, the agendas and the results of all Stakeholder meetings were published in the Borrego Sun as well as shown on the BWD website. Thus, residents of the Borrego Valley DAC were kept informed of the process.

1.2.8 Climate Change Impacts

Available information on climate change suggests two impacts for the Region: (1) The DWR Climatologist predicts that climate change would result in less mountain block recharge thus impacting the long-term support for Regional aquifers and that (2) annual runoff would become more variable and with greater extremes.

The RWMG does not have knowledge of a climate change model for the Region; however, the California Department of Water Resources (CDWR) produced a special

report[1] that utilized several climate change models that would appear to be useful to assess future changes in water resources in the Region. That report shows that a large Region, including the ABD Region, is predicted to decrease in annual runoff of between a negative 10 and 20 percent for the period 2014-2060. This prediction was confirmed by more than 90% of the models.

Thus, these climate changes could have a significant impact on the limited precipitation and runoff available within the Region. For example, it is estimated that the historic available recharge to the Borrego Valley aquifer is about 4,000 afy. A 400-800 afy decrease in this supply would increase the overdraft of the aquifer and shorten its useful life. Other communities in the Region depend on extracting groundwater from fractured mountain block rocks, which are normally difficult to recharge and would became more so if the rainfall and runoff were not only reduced but become more extreme and variable in its occurrence. These communities area already extracting the maximum yield from these sources.

1.2.9 Water Quality Conditions

The quality of the extracted groundwater's by the BWD in the Borrego Valley Basin vary from around 300 mg/L to 700 mg/L (TDS). Most of the water has Nitrate concentrations in the lowest quartile of the drinking water standard. Very little data has been obtained from the area of the basin intensively used by agriculture. A few samples have been obtained but are not sufficient to draw conclusions about the entire area, but these do show elevated TDS and Nitrate concentrations. All water delivered by BWD and Canebrake meets the Primary Drinking Water Standards.

There are no known contamination sites in the Region.

1.2.10 Social and Cultural Makeup of the Regional Community

The Borrego Springs community appears to be the only DAC in the Region. Reliable information, but undocumented, indicates that the Canebrake community's MHI is higher than that threshold to qualify for a DAC.

A table in Section 2.11 of this Plan shows a snap shot of the social and cultural make up of the Region. Conclusions that are drawn about the Region:

- Relatively low MHI
- Significant population of Hispanics

As will be presented later in the Plan, little or no growth is expected in the two communities that are a part of this process. The Borrego area is limited by water supply and the Canebrake area is surrounded by federal and state lands.

The benefits of the IRWM Plan being prepared are discussed in some detain the Section 6 of this Plan.

1.2.11 Tribal Government:

There are four Indian reservations located in the region. The Los Coyotes Reservation is located in the northwestern portion of the region and has approximately 70 residents. The Campo, Ewiiaapaayp and Manzanita Reservations are located in the mountainous area in the southwestern portion of the region. The Campo Indians have the

[1] California Department of Water Resources, *Special Report for the XXVI Border Governors Conference*, July, 2008.

largest population with 350, the Manzanita Reservation has 70 and the Ewiiaapaayp do not reside on the portion of the reservation located in our region. The entities were contacted on numerous occasions to participate in the Stakeholders meeting. However, they declined to participate in the process. The stakeholder's committee is working with representatives of the groups to solicit their issues for incorporation into the IRWM process. However, the Ewiiaapaayp Band of Indians did provide a report on their water supplies.

1.2.12 Issues and Conflicts for the Region

Water supply to the Region is composed of runoff from the surrounding mountain watersheds. These flows recharge the Borrego Valley aquifer and the fractured mountain basin complex along water courses. Water is extracted from numerous wells. Most of the extractions are not measured and are therefore estimated water use is estimated by indirect methods. Water districts and CSDs measure their extractions.
Section 2 (2.13) of the partially completed Plan contains detailed description of the water management issues and conflicts in the Region, but to summarize these:

The overdraft of the Borrego Aquifer is the paramount issue in the northern area of the Region. This long standing overdraft has created conflicts between the local residents, growers and the environmental interests. A recent finding by the USGS that the main producing aquifer has an expected future productive life of only 50 years has elevated this issue. The County and the BWD have adopted ordinances that prohibit new water requiring developments without full mitigation of the new demand.

The Park's issues concerns include the lowering of water levels in the Borrego Aquifer, water diversions upstream and outside the Park and need for upgrading existing wells at several camp grounds. Additional concerns are the replacement of native plants with invasive species.

The small water supply communities located in the central and southern areas of the Region are concerned about declining water levels in block mountain fractured rocks that are their only water supply source. In addition, they lack back up wells and need additional surface storage to provide for fire and operational storage. A leaking transmission main is also in need of replacement.

Controlling infrequent storm events is a concern throughout the Region as prior major storm events have caused substantial damage and endangered life.

1.2.13 Neighboring IRWM Efforts

Two nearby IRWM's are currently in the planning phase. The Coachella Valley IRWM is lactated immediately to the northeast and the Imperial County IRWM is situated directly and adjacent to the ABD IRWM. Representatives from the ABD IRWM regularly attend meetings of these two processes.

A third IRWM Region exists immediately to the west of the ABD Region. This San Diego IRWM has been in existence for some time and has prepared an IRWM plan which has been adopted by participating agencies.

1.3 Existing or Partially Completed IRWM Plans

The IRWM process was initiated by the RWMG in January of 2010 via a Public Kick-Off meeting. Subsequent to that, all interested participants were organized into a

Stakeholders Committee. The RWMG officially became the Policy/ Steering committee. Monthly meetings of both the Policy and Stakeholders committees were immediately initiated and work was begun on developing an IRWM Plan. As of September 17, 2010 a major portion of the Plan has been completed in draft form. Plan Sections covering Governance, Description of Region, Goals, Objective and Target, Integration of Water Management Strategies, Project Review Process and Impact and Benefits have been produced. It is expected that the Plan will be completed and subsequently adopted by the first quarter of calendar 2011.

1.4 Public Process to Identify Stakeholders and Their Inclusion in the Planning and Decision Process

As indicated above, the IRWM process was initiated by a public meeting. Prior to that, a notification of the meeting was published in the local newspaper, the Borrego Sun. Invitations by direct telephone calls were made to the three water supply communities located in the central and southern areas of the Region. Telephone invitations were also made to the tribal councils that owned land within the Region. Also contacted were all of the known non-profits, NGOs and governmental agencies that were known to have an interest in water management.

Follow up invitation letters were also sent to all those contacted. The letters and newspaper announcement described the IRWM process and its purpose. The BWD website was modified to include a link to the IRWM process.

It was initially envisioned that several stakeholder committees (Stakeholders, Technical and Public Information Dissemination) would be established, but due to the relatively small attendance at the first meeting, those stakeholders agreed that a single Stakeholder committee would suffice. The Stakeholder committee agreed to meet monthly until the Plan was completed.

The role of the Stakeholder committee was discussed and established as the decision group in formulating and construction the IRWM Plan. This would include the establishment of goals and objectives of the Plan and the incorporation and analysis of projects that would be included in the Plan.

Attendance at the meetings has usually included the BWD, Canebrake CWD, the growers as represented by the Agricultural Alliance for Water and Resource Education (AAWARE), the AB Foundation, the ABD State Park, the Rural Community Assistance Corporation (RCAC), San Diego Flood Control District, the Golf Course Association of Borrego Valley, the Bureau of Land Management (BLM), the Ocotillo Wells State Vehicle Recreational Area, 3-4 local residents and the Borrego Sun newspaper. Minutes were prepared by a recording secretary and distributed by email to the participants and posted on the BWD website.

Stakeholder participation has always been somewhat less than desired, however, it is believed that attendance has been good considering that two of the four water supply agencies decided not to participate, the small population residing in the Region and the remoteness of the two remaining water supply participating agencies.

1.5 Identification of DAC and their Inclusion in the Process

A review of the 2000 Census (factfinder) showed that the Borrego Valley's Median Household Income is less than 80% of the State wide average. Since the 2000 census does not provide a geographic breakdown of areas within the census tract, it was not possible to identify a specific area of the Borrego Springs community as 'disadvantaged'.

2000 Census data was also queried for the Canebrake CWD. The Median Household Income for the blocks comprising this water agency showed a 2000 census MHI greater than 80% of the State wide average. Since the other two water agencies declined to participate in the IRWM process, their MHI was not determined.

Since the entire community of Borrego Springs is considered disadvantaged, and the public members of that community, local NGOs and non-profits were participants in the Stakeholders Committee, the Borrego Valley DAC was engaged. To further engage the community, the agendas and the results of all Stakeholder meetings were published in the Borrego Sun as well as shown on the BWD website. Thus, residents of the Borrego Valley DAC were kept informed of the process.

1.6 Process Used to Identify Region's Water Related Objectives and Conflicts

The Policy Committee initially established the goals of the plan. After review and discussion at the Stakeholder committee, the goals were thought to address the major issues facing the Region (water supply and water quality) and the processes (environmental stewardship and Regional planning) through which to the goals should be accomplished. Thus, the goals were subsequently confirmed and adopted at the stakeholder level.

Through facilitated public workshops and Stakeholder meetings, stakeholders developed six specific IRWM Plan objectives to accomplish the four IRWM Plan goals. Conflicts have historically come about due to lack of communication and where there is no forum for debate or compromise. With this new regional gathering, conflicts can be addressed and reconciled as a group.

1.7 Criteria for Developing Regional Priorities

IRWM Program Guidelines (2009) identified nearly thirty water management strategies, as part of the California Water Plan Update, 2009, that describe potential strategies for managing water resources. The Stakeholders reviewed the entire range of RMSs and others and developed a two-step process to identify groups of strategies that work together to mutually support Plan objectives and provide additional environmental, water resource management or other benefits.

Step 1: Identify Primary Water Management Strategies that Directly Address Plan Objectives.

In this step, The Stakeholders Committee reviewed and discussed potential Regional Management Strategies (RMS), which should be considered and would provide the best support for the development of the IRWM Plan. A consensus process was used to select the RMSs. Selected RMSs and their strategy content are shown and defined in the Table 4-1.

Table 4-1 Regional Managements Strategies (from DRAFT IRWM Plan)

Table 4-1 is continued on next two pages

(Number in brackets refers to Chapter number in CWP 2009 and are not in order of importance)

Agricultural Water Use Efficiency (#2)
Increasing water use efficiency and achieving reductions in the amount of water used for agricultural irrigation. Includes incentives, public education, and other efficiency-enhancing programs.

Urban Water Use Efficiency (#3)
Increasing water use efficiency by achieving reductions in the amount of water used for municipal, commercial, industrial, irrigation, and aesthetic purposes. Includes incentives, public education, and other efficiency-enhancing programs.

Conveyance Regional/Local (#5)
The development of new conveyance systems that could provide supplemental water supplies to the region.

Watershed Management (#7)
Comprehensive management, protection, and enhancement of groundwater and surface waters, natural resources, and habitat

Conjunctive Management Groundwater (#8)
Using and managing groundwater supplies to ensure sustainable groundwater yields while maintaining groundwater-dependent beneficial uses, including coordinating management of groundwater and surface water supplies (conjunctive use)

Desalination (#9)
Developing potable water supplies through desalination of brackish groundwater and perched water. Includes disposal of waste brine.

Surface Storage – Local and Regional (#13)
Developing additional yield through construction or modification (enlargement) of local surface detention basins or developing groundwater storage capabilities in out-of-region reservoirs.

Pollution Prevention (#17)
Strategies that prevent pollution, including public education, efforts to identify and control pollutant contributing activities, and regulation of pollution causing activities. Includes identifying, reducing, controlling, and managing pollutant loads from non-point sources.

Agricultural Lands Stewardship (#20)
Includes strategies for promoting continued agricultural use of lands (e.g. agricultural preserves), strategies to reduce pollutants from agricultural lands, and strategies create wildlife habitat within agricultural lands. Stewardship strategies for agricultural lands include erosion reduction measures, invasive species removal, and conservation by mulching.

Economic Incentives (#21)
Includes economic incentives (e.g. loans, grants, water pricing) to promote resource

preservation or enhancement.

Ecosystem Restoration (#22)
Strategies that restore impacted or impaired ecosystems, and may include invasive species removal, land acquisition, water quality protection, revegetation, habitat protection and improvement, habitat management and species monitoring.

Forest Management (#23)
The active management of lands to eliminate invasive species that consume water in excess of native vegetation and can cause impairment of storm flows.

Land Use Planning & Management (#24)
Includes land use controls to manage, minimize, or control activities that may negatively affect the quality and availability of groundwater waters, natural resources, or endangered or threatened species.

Water-dependent Recreation (#26)
Enhancing and protecting water-dependent recreational opportunities and public access to recreational lands.

Water Transfers (#27)
Contracting to provide new outside sources of imported water to the Region, potentially State Water Project and Colorado River supplies or supplies from groundwater basins or perched water tables.

Flood Risk Management (#28)
Strategies that decrease the potential for flood-related damage to property or life including control or management of floodplain lands or physical projects to control runoff.

Step 2: Develop Integrated RMSs Groupings for Each Objective. The strategies that best address each previously identified objective were then identified and integrated with other compatible strategies to achieve each objective. The Stakeholders also prioritized the objectives. The following table represents the results of a consensus process to identify and integrate the most important RMSs for the Plan.

1.8 Collection, Analysis and Management of Data Collected

Data collected thus far has only amounted to prior reports, memos, letters and minutes of meetings. These are routinely stored in the BWD files and entered into the BWD GIS.

Raw data such as groundwater levels, water quality, pumping tests, etc when collected is also stored in the BWD GIS. The GIS was developed in conjunction with the development of numeric model currently being formulated by the US Geological Survey.

Currently, BWD staff and consultants are working to integrate the Park's extensive GIS, which covers a great deal of the Region, with the BWD GIS. A future step is to incorporate portions of the County of San Diego's GIS into a Regional GIS.

1.9 How Integrated Resource Management Strategies will be Employed

The Stakeholders utilized the RMSs to establish a priority ranking of the candidate projects submitted for inclusion in the Plan. The process utilized was: (1)

establish a priority ranking among the RMSs selected for the Region. This was accomplished through a consensus process by prioritizing the objectives for the Region and then grouping the RMSs associated with each prioritized objective (Table 4-2). (2) assessing each candidate project's association with the selected RMSs for the region. The results of this process yielded three tiers of candidate projects.

Table 4-2 (from DRAFT IRWM Plan)
Integration of RMSs and Prioritization of Objectives

Priority Strategies	Objectives (Section 3)	Integration of Regional Management
1	Reduce Water Demand	Agricultural Water Use Efficiency Urban Water Use Efficiency
1	Increase Water Supply	Conjunctive Groundwater Storage Desalination - Brackish Surface Storage – Local/Regional
2	Practice Resource Stewardship	Agricultural Lands Stewardship Economic Incentives Ecosystem Restoration Forest Management Land Use Planning & Management Water-dependent Recreation Watershed Management
3	Improve Operational Efficiency & Transfers	Water Transfers Conveyance - Regional/Local
4	Improve Water Quality	Pollution Prevention
5	Improve Flood Management	Flood Risk Management

The first tier of candidate projects was identified as meeting the first priority objectives of Reducing Water Demand and Increase Water Supply (Table 5-1). All of these candidate projects met more than one RMS, thus creating an integration and synergistic effect among the RMSs.

Since many of the candidate projects were found to fall in Tier 1, a screening process was utilized to select those candidate projects which could be implemented in the near term. These projects were not encumbered by externalities such as agreements with other agencies, regulatory requirement and the like. Therefore, these projects became the Tier 1 Short Term Implementation projects of the Plan. Those projects requiring additional information, etc. were then designated as Tier 1 Longer Term Plan Implementation projects.

Table 5-1 (from DRAFT IRWM Plan)

Table 5-1

Regional Management Strategies Associated with Each CP

Priortized RMs for Regions from Table 4-2 →	1					2							3		4	5
Regional RMS CWP Update 2009 Chapt. No.→	2	3	8	9	13	20	21	22	23	24	26	27	5	7	17	28
CP No.	Regional Management Strategies → / Candidate Projects ↓	Agricultural Water Use Efficiency	Urban Water Use Efficiency	Groundwater Mgt./Conjunctive Use	Desalination Brackish Water	Storage- Local/Regional	Agricultural Lands Stewardship	Economic Incentives	Ecosystem Restoration	Forest Management	Land Use Planning & Management	Recreation and Public Access	Watershed Management	Conveyance - Regional/Local	Water Transfers	Groundwater Protection	Flood Risk Management
1	Soil Erosion Fallowing - BV						X		O	X	X		O				
2	Soil Stabilization-Borrego Sink - BV								X	O			X				
3	Habitat Restorization - Region							O	X	O	O	O	X				X
4	Depth Dependent Water Quality Data - BV			X		O		O	O		O					X	
5	Hydrological Investigation-Canebrake			X				O			O						
6	Numeric Model Development - BV		O	X		X		O			O					X	
7	Water Quality in Agricultural Area - BV	O		X			O									X	
8	Clark Lake Groundwater Investigation - BV			X							O			X			
9	Water Easement Purchases - BV	X		O			X	X			X					O	
10	Allegretti Farms Groundwater Invest. - BV			X	O						O			X	X		
11	Dr. Nel - BV			X							O			X	X		
12	IID and Water Banking - BV			X	O	O		O	O		O			X	X		
13	Recharge Basins - BV			O		X		O			O	X	O				X
14	Mulching for Water Conservation - BV	X					X	O									
15	Tamarisk Removal - Region	O					O		X	X			X				X
16	Educational Out Reach - Region	O	O				O	O			O		O			X	
17	Water System Improvement - Canbrake		X					O			O			X			
18	Water Quality Well Testing (Region)			X												X	
19	Gauging Station Monitorng System (Region)															O	X
20	Replacement Wells at Campgrounds (Park)			X													

A Tier 2 list of candidate projects was also developed. These projects meet the second highest priority Objective of Practice Resource Stewardship. Seven RMSs were associated with this Objective. These projects were also included as Implementation Projects in the Plan.

1.10 How the Plan will be implemented and Impacts and what Benefits Expected

It is expected that as funding becomes available, each of the Tier 1 Short Term Implementation projects will be reviewed for scope, implementation schedule and reasonableness of cost. The Stakeholders and the Policy Committees will then prioritize the Implementation projects and select the highest ranking projects that can be implemented with the available funding.

The BWD will become the recipient of the grant funds and will contract with consultants or other agencies to perform the projects.

The Stakeholders group also participated in an exercise directed at identifying the benefits of all projects submitted for consideration. The projects were first grouped into categories established as Statewide Priorities. These included Environmental Stewardship, Protect Groundwater Quality, Drought Preparedness (this category was further subdivided into Supply Augmentation, Water Conservation and Small Systems) and Protect Water Quality. Project benefits were identified as:

- Water Supply
- Water Quality
- Water Reliability
- Water Conservation
- Storm Water Capture
- Invasive Species Removal
- Water Banking
- Integrated Flood Management
- Watershed Management
- Regional Concept

Table 6-2 displays the benefits resulting from each of the candidate projects submitted on inclusion in the plan. The projects are grouped according to Statewide priorities. Further, the Stakeholders discussed the benefits of each project and then prioritized the projects within each Statewide priority. As indicated above, the Stakeholders further identified the benefits that would be associated with each of the candidate projects.

Table 6-2 (from DRAFT IRWM Plan)

Table 6-2

Prioritized Projects and Benefits

Revised as per Subcommittee 5-25-10

Regional Issues by Statewide Priorities	Priority	Project Benefits: Water Supply	Water Quality	Water Reliability	Water Conservation	Storm Water Capture	Invasive Species	Water Banking	Integrated Flood Mgt.	Watershed Management	Regional Concept
Environmental Stewardship											
Soil Erosion from Fallowing - BV	1									✓	
Soil Stabilization of the Borrego Sink - BV	3									✓	
Wetlands/Habitat Restoration/Enhancement Projects - Region	2									✓	✓
Protect Groundwater Quality											
Water Quality Depth Dependent Data - BV	3	✓	✓	✓							
Groundwater Model of Borrego Basin by USGS - BV	1	✓		✓							
Hydrogeologic -Canebrake	2	✓		✓							
Water Quality in the Agricultural Area BV	4		✓	✓							
Drought Preparedness - Supply Augmentation											
Groundwater Investigation in Clark Lake -BV	1	✓	✓	✓							
Allegretti Farms Groundwater Basin - BV	4	✓	✓	✓				✓			
IID and Water Banking - BV	3	✓		✓				✓			
Purchase of Water Easements -BV	2	✓		✓							
Dr. Nel Property - BV	5	✓		✓							
Drought Preparedness - Water Conservation											
Tamarisk Removal - Region (Prop 1E Funding)	2				✓		✓		✓	✓	
Mulching for Water Conservation - BV	3				✓						
Recharge Basins - BV (Prop 1E Funding)	1	✓			✓	✓			✓		
Drought Preparedness - Small Systems											
Back-up Wells; Storage; Pipeline Replacement - Canebrake	1	✓	✓	✓	✓						
Testing Well Water Non-Municipal Systems - Region*	2		✓								✓
Protect Water Quality - Public Education											
Outreach Water Pollution Prevention and Conservation - Region	2		✓								✓
School Districts Wellness Program - Region	1		✓								✓

1.11 Benefits to DACs

The ABD IRWM region is a series of disadvantaged communities dotting the eastern portion of unincorporated San Diego County. Only a few population centers fall in the region, the largest being Borrego Springs, followed by Jacumba, the Majestic Pines community near Julian, Canebrake, Shelter Valley and Ocotillo Wells. Most all of these areas rely on groundwater for drinking and septic systems for waste disposal, the exceptions being a small portion of Borrego Springs and all of the Majestic Pines subdivision. Many of the individual private homesteads utilize decades old water wells with very little idea of the water quality or longevity of the supply. The county of San Diego oversees the general health conditions of the water supplies but has very little budget to perform any water quality or aquifer testing in the remote East County areas.

The DAC element for the region will focus on water quality analysis and wellhead education to ensure the entire population has safe drinking water. In addition, information will be disseminated on preventing cross connection/backflow contamination

of the drinking water systems to educate our neighbors on proper piping and irrigation practices.

School educational programs will also be a high priority of the IRWMP. These programs will include educating elementary school children on the dangers of drinking pooled or stagnant waters, middle school will feature programs on the hydrologic cycle and from where our water comes and high school programs will teach the young adults on water quality and sustainability. All levels will be instructed in water conservation programs and how these principles can be applied to our everyday lives.

Further education is needed with the landscape irrigators and gardeners. Many have little concept as to cross connection/backflow contamination and education on this matter is prudent for safe drinking water. Also the landscapers could utilize irrigation training on smart irrigation timers with weather station-based systems and other innovative products for more effective water delivery. These programs need to be instructed in both English and Spanish languages.

Of the four communities that deliver water supply in the Region, two declined to participate. Of the remaining two, only Borrego is economically disadvantaged. The Plan identifies significant indirect benefits to this community.

1.11.1 Benefits to the Borrego Valley DAC

Borrego Valley area is economically disadvantaged. The Plan identifies three significant benefits to this community.

(1) Reduction in Groundwater Level Decline**:** The chief issue in this area is the constant lowering of the groundwater levels. Annual decline levels range from 2 to 4 feet per year, with an average of about 3 feet per year. There is some indication that the rate of decline is increasing due to the 'bowl' shaped nature of the groundwater basin, however, this has not been confirmed.

This is a potential substantial impact on the DAC as groundwater pumping costs are a significant factor in determining the water rates paid by the community. For example, with current electrical rates, a 100 foot drop in groundwater levels would result in an increase pumping cost of about $15 per acre foot. Thus, implementation projects that reduce the water demand have the impact of decreasing the rate of lowering of the water table and subsequently the benefit of reducing the cost of water extraction that would otherwise occur and ultimately translate into a reduction in the amount of O&M expense required to be passed on to the DAC rate payers.

Implementation Plan projects #9 - Water Easement Purchases and #14 – Mulching for Water Conservation both have the impact of reducing water demand. Tiered water rates, an existing program of BWD, also impacts the lowering of water levels and provides benefits to the DAC.

(2) Deferring Importation Projects: Reducing water demand also serves to defer the ultimate need to import water into the Valley. The importation projects identified, with the exception of the Clark Lake Importation Project, have associated costs that far exceed the local community's ability to fund the projects. The existing community is too small and economically disadvantaged to afford these projects without substantial grant or subsidy funding from State and Federal sources. A secondary impact and benefit results from a delay in the expenditures for an importation project. A delay would allow

the ratepayer or project funding base to increase so that the expenditure would be spread over a larger economic and population base.

All would require a significant State or Federal grant to provide a reduction in the rate necessary to fully fund the construction and operation of the project. These would have a substantial impact on the DACs water rates.

The impact and advantage of reducing water demand is to allow time for the community to transform its economic base from agriculture to residential. Existing policies will allow this to occur without an increase in water demand. In fact, under the BWD policy, the conversion would reduce the water demand on the basin. Also, increasing water supply, without importation, would have the same impact and benefit.

Finally, project #13 Recharge Basins has the impact of increasing water supply, but has the dual impact as Reducing Demand and Increasing Water Supply. (Reducing groundwater level decline)

(3) Water Quality Protection: The protection of groundwater quality is an important benefit of several of the Plan projects. Nitrate invasion into one of BWD wells has already caused the well to be closed and a new well drilled as a replacement. Thus, poor water quality that may exist in the area intensively used for agricultural purposes or deeper groundwater of poor quality that might 'up-well', could render existing wells un-useable without treatment or abandonment and re-drilling. Both are expensive options.

If these water quality intrusions were to be realized, the significant remediation or correction expense would be passed on to the DAC rate payers. Thus, water quality projects included in the Plan would allow 'early warning' signals and mitigation programs to be implemented to prevent the occurrence.

The Implementation Plan includes the following water quality projects: #4 Depth Dependent Water Quality Data, #6 Numeric Model Development and #7 – Water Quality in Agricultural Area. These Projects implement the objective of Improve Water Quality, but also serve to prevent the loss of water supply.

1.11.2 Benefits to DACs Not Participating in the Plan

The ABD IRWM region is a series of disadvantaged communities dotting the eastern portion of unincorporated San Diego County. Only a few population centers fall in the region, the largest being Borrego Springs, followed by Jacumba, the Majestic Pines community near Julian, Canebrake, Shelter Valley and Ocotillo Wells. Most all of these areas rely on groundwater for drinking and septic systems for waste disposal, the exceptions being a small portion of Borrego Springs and all of the Majestic Pines subdivision. Many of the individual private homesteads utilize decades old water wells with very little idea of the water quality or longevity of the supply. The county of San Diego oversees the general health conditions of the water supplies but has very little budget to perform any water quality or aquifer testing in the remote East County areas.

The DAC element for the region will focus on water quality analysis and wellhead education to ensure the entire population has safe drinking water. In addition, information will be disseminated on preventing cross connection/backflow contamination of the drinking water systems to educate our neighbors on proper piping and irrigation practices.

School educational programs will also be a high priority of the IRWMP. These programs will include educating elementary school children on the dangers of drinking

pooled or stagnant waters, middle school will feature programs on the hydrologic cycle and from where our water comes and high school programs will teach the young adults on water quality and sustainability. All levels will be instructed in water conservation programs and how these principles can be applied to our everyday lives.

Further education is needed with the landscape irrigators and gardeners. Many have little concept as to cross connection/backflow contamination and education on this matter is prudent for safe drinking water. Also the landscapers could utilize irrigation training on smart irrigation timers with weather station-based systems and other innovative products for more effective water delivery. These programs need to be instructed in both English and Spanish languages.

Of the four communities that deliver water supply and have agreed to participate in this Plan, Borrego and Jacumba, are economically disadvantaged. The Plan identifies significant indirect benefits to these communities.

This background section was a combined effort involving stakeholder input and authorship. As stated at the beginning, the IRWM process brought the various entities together for the first time to share issues as a region and will continue to do so, in the future.